

## *EXHIBIT M*

# **Loveland vs Goodyear**

## **2003 Chevrolet Silverado C1500**

*Accident Date:* May 1, 2015  
*Accident Location:* Hall County, Nebraska

*Report by:*  
Micky Gilbert, P.E.  
March 12, 2019

Prepared for: Kaster Lynch Farrar & Ball  
1010 Lamar  
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**Table of Contents**

<b>I.</b>	<b>Purpose</b>	<b>2</b>
<b>II.</b>	<b>Introduction/Qualifications</b>	<b>3-4</b>
<b>III.</b>	<b>Materials Reviewed</b>	<b>5-8</b>
<b>IV.</b>	<b>Background Information</b>	<b>9</b>
<b>V.</b>	<b>Accident Reconstruction</b>	<b>10-17</b>
<b>VI.</b>	<b>Driver Response Studies</b>	<b>18</b>
<b>VII.</b>	<b>Opinions/Conclusions</b>	<b>19</b>

Attachment 1	Curriculum Vitae
Attachment 2	List of Prior Testimony
Attachment 3	Fee Schedule

## **I. Purpose**

We were asked to assist in the investigation and evaluation of the subject accident by:

- A. Reconstructing the accident sequence.
- B. Determining the speed and angular rates of the vehicle at various points within the accident sequence.
- C. Discussing tire failure and its effect on vehicle handling.
- D. Determining whether or not there were any pre-accident vehicle conditions that contributed to this accident.

## II. Introduction/Qualifications

As a licensed professional engineer in my home state, Colorado, I have worked as a consultant and accident reconstructionist in numerous jurisdictions. I received my B.S. degree in Mechanical Engineering from Colorado State University in 1993. I have investigated thousands automobile accidents, the majority of which were sport utility vehicle rollovers. I have been an active member of the Society of Accident Reconstructionists (SOAR), Accreditation Commission for Traffic Accident Reconstruction (ACTAR), Accident Reconstruction Communications Network (ARC Network), National Association of Professional Accident Reconstruction Specialists (NAPARS), Canadian Association of Road Safety Professionals (CARSP), and the Society of Automotive Engineers (SAE). I have written numerous papers, taught classes and given presentations on accident reconstruction issues to attorneys, insurance adjusters, engineers and police officers.

My company performed the first ever documented un-tripped rollover crash test of an SUV. We designed an automated vehicle system that steered, braked and accelerated the vehicle by remote. The 1991 Ford Explorer rolled over un-tripped on dry, flat pavement. The dynamics of that crash test confirm and support those seen in other rollover accidents. The results of that crash test were presented at the 2006 ITMA conference in Melbourne, Australia. We were asked to perform a similar automated rollover crash test on a Toyota 4Runner at an ARC crash conference in Las Vegas in June 2006. The results from that test were presented to over 250 accident investigators.

My company also performed a similar rollover test of an SUV with a tire tread separation for a police officer organization called MATAI in Iowa. This test involved a tread separation of the left-rear tire, followed by a rollover to the driver's side. We have also performed instrumented handling tests of an SUV with a separated tread. This testing illustrates that even relatively small driver inputs can cause loss-of-control for an average driver. A J-turn test run with only 65 degrees of steering input at a speed of 39 mph resulted in an uncontrollable spin due to the diminished cornering capacity of the separated tire. Our results were presented at a Canadian Road Safety conference in June 2009.

I was granted a United States Patent for an anti-rollover design, "Method and Apparatus for Reducing Vehicle Rollover." I tested a prototype design and presented a paper regarding its operation to the Society of Automotive Engineers (SAE) at the 2000 International Body Engineering Conference and Exposition (IBEC). The prototype design successfully prevented un-tripped rollover of an Isuzu Trooper during testing.

I have investigated several hundred Sport Utility Vehicle, automobile, light truck, and heavy truck rollover accidents within the last four years and have done full accident reconstructions on many of these. I have performed instrumented testing of several vehicles equipped with different versions of yaw control, which is synonymous with electronic stability control (ESC). I have performed instrumented handling tests on

vehicles with de-treaded and low-tread tires mounted on front vs. rear axles and published papers based on the test results.

I have authored several published peer-reviewed papers focused on yaw stability of vehicles during limit handling maneuvers, including “Effect of Yaw Control on SUV Rollover,” which analyzed the effect of yaw control (ESC) on SUV accident avoidance maneuvers.

I have studied rollover resistance testing and wrote a docket submission to the National Highway Traffic Safety Administration (NHTSA) regarding the relationship between vehicle geometry and the force required for rollover, based on rollover test data generated by Toyota Motor Corporation. I have performed rollover resistance testing on many different vehicles. I presented a rollover testing paper that I wrote to the Japanese Society of Automotive Engineers in Chiba, Japan.

I have also performed rollover testing after modifying vehicle suspension components and tires, which can prevent un-tripped rollover and cause a vehicle to slide at its limit. I developed a test protocol called the Double Steer Maneuver, which specifies vehicle modifications and the test procedure. This procedure was submitted to a NHTSA docket. I have been involved in the manufacture and sale of modifications for Sport Utility Vehicles.

I raced formula cars and have won three series championships since 1991, which helps me understand how vehicles handle and that vehicles (including sport utility vehicles) can slide rather than roll over at their limits. My racing experience includes extensive data analysis and suspension tuning. In 2006 I obtained my Indy Racing League (IRL) competition license and drove in my first two Firestone Indy Lights races. I drove in the Firestone Indy Lights series during the 2007 and 2008 seasons. This experience, along with my rollover resistance testing, gives me firsthand knowledge of how vehicles roll over and the circumstances under which it can happen with some of the least stable vehicles. My racing experience also includes several on-track tire failure occurrences.

I have also performed rollover/limit handling tests with the same Automotive Testing, Inc. (ATI) and SEA steering machines as used by the Government (NHTSA) in their rollover resistance/yaw control (ESC) tests and have been granted a United States Patent on a manual steering limiter, “Rotation Limiter,” used in rollover testing.

I was the Chief Driving Instructor of Pro-One Motorsports academy from 1999-2000. I have also been a driving instructor for a BMW car club in Colorado. Additionally, I have participated as an instructor in a driving class for teenagers called Street Survival, which launched in 2002. The course’s mission is to teach young drivers about their car’s handling limits in hope of saving lives. Through this experience and my other racing activities, I have developed a sense for average driver capabilities and typical untrained driver steering responses in emergencies.

### III. Materials Reviewed

- State of Nebraska Accident Report
- Police Photos
- Investigator Photos
- Bosch CDR Report
- Legal Documents and Exhibits/Discovery
- Carfax Report for Subject Vehicle
- MSN Autos Information for Subject Vehicle
- Case Specific Depositions and Exhibits
- Gilbert Engineering LLC accident scene inspection notes and photographs

#### **GE Core Materials**

- Gilbert Engineering LLC test materials for many vehicles, including actual rollover
- Gilbert Engineering LLC test materials for 2006 Ford F350 Dually Blowout Testing
- Gilbert Engineering LLC test materials for 1998 Ford Explorer 4-door 4x2
- Gilbert Engineering LLC test materials for 2001 Mercury Mountaineer 4x2
- Gilbert Engineering Test Materials for 1992 Chevrolet Cavalier
- Gilbert Engineering Test Materials for 2002 Volvo S80 T6
- Test materials for Gilbert Engineering LLC testing of 2003 Ford Explorer AWD
- Gilbert Engineering 1991 Ford Explorer Automated Untripped Rollover Test
- Gilbert Engineering 1997 Toyota 4Runner Automated Untripped Rollover Test
- Gilbert Engineering Test Procedure: Double Steer Maneuver
- Gilbert Engineering LLC test reports of several vehicles
- Federal Register, Docket 2001-9663, Notice 1, Rollover Resistance
- Federal Register, Docket 2001-9663, Notice 2, Rollover Resistance
- Federal Register, Docket 2001-9663, Notice 3, Rollover Resistance
- Phase II of NHTSA's Light Vehicle Rollover Research Program
- Phase IV of NHTSA's Light Vehicle Rollover Research Program
- Phase VI and VII of NHTSA's Light Vehicle Rollover Research Program
- Driver response studies
- Toyota LAR test materials, including summary charts
- "A Study on Rollover of Sport Utility Vehicle", Ichimura, K., Yonekawa, T.
- CU Avoidance Maneuver
- NHTSA Rollover Docket 2000-8298 Micky Gilbert Submittal
- Gilbert Engineering LLC Comments to NHTSA Docket 2001-9663
- Manufacturer's comments to Rollover Docket 2001-9663
- Technical Assessment Paper
- Wheel Spacer information
- "On-Road Crash Experience of Utility Vehicles"
- Track width measurements of several sport utility vehicles
- Gilbert Engineering/Mechanical Systems Rim Gouge Paper
- Gilbert Engineering Tire Wear Paper – SAE #2003-01-2865
- Automotive News production numbers
- Background technical literature and textbooks
- Reconstruction manuals and technical literature
- Car Suspension and Handling, Bastow, Howard, Whitehead, SAE 2004
- Tires, Suspension and Handling, John C. Dixon, SAE 1996

- Tire and Vehicle Dynamics, Hans B. Pacejka, SAE 2002
- The Racing & High-Performance Tire, Paul Haney, SAE 2003
- Race Car Vehicle Dynamics, Milliken and Milliken, SAE 1995
- Dictionary of Automotive Engineering, Don Goodsell, SAE 1995
- Chassis Engineering, Herb Adams, HPBooks 1993
- How to Make Your Car Handle, Fred Puhn, HPBooks 1981
- Tire Forensic Investigation – Analyzing Tire Failure, SAE 2008
- Micky G. Gilbert, John Olmstead, Erich Woessner, Tom Mueller, “Effect of Yaw Control on SUV Rollover”, The SOARce, Autumn 2004
- Micky G. Gilbert, John Olmstead, Erich Woessner, Tom Mueller, “Rollover Testing: Analysis of Steer Input Timing”, SAE Paper Number 2006-01-0801 – presented at 2006 SAE World Congress (4/6/06)
- Gilbert Engineering LLC, “1991 Ford Explorer XLT 4x2: Automated Untripped Rollover Test”, ARC-CSI Crash Conference 2006
- Micky Gilbert, Tom Mueller, “2001 Ford E-350 XLT Super Duty Vehicle Dynamic Performance Testing” The SOARce, Winter 2007
- Wilson, L.A., Gilbert, M., Godrick, D., “Reconstruction and Analysis of Steering-induced, On-road, Untripped SUV Rollover Tests” Collision, Spring 2007
- Wilson, L.A., Gilbert, M., Godrick, D., “Reconstruction and Analysis of Steering-induced, On-road, Untripped SUV Rollover Tests (Part 2)” Collision, Winter 2007
- Micky G. Gilbert, John Olmstead, Erich Woessner, Tom Mueller, “Wet Pavement Handling Tests”, The SOARce, Autumn 2005
- Micky Gilbert, P.E. and Daniel A. Godrick, “Vehicle Dynamic Performance Testing 2002 Volvo S80 T6,” The SOARce, Winter 2008
- M. Gilbert, D. Yanda, T. Mueller, “Dynamic testing of an SUV with Tire Tread Separation”, Canadian Multidisciplinary Road Safety Conference XIX
- M. Gilbert, T. Mueller, J. Nirvelli, “The Effect of Tread-Separation on Vehicle Controllability,” Hazard Information Foundation, Inc (HIFI) Tire Tech Conference, 8/2010
- “Pre-Rollover Vehicle Dynamics of SUVs in Untripped Rollover Tests,” Micky Gilbert, P.E. and Brad Stolz, M.S., Canadian Multidisciplinary Road Safety Conference XX
- “Forensic Interpretation of Driver Countersteer,” M. Gilbert, T. Mueller, J. Nirvelli, 22nd Canadian Multidisciplinary Road Safety Conference, Banff, Alberta, June 10-13, 2012
- “Tire Forensic Investigation – Analyzing Tire Failure,” Thomas R. Giapponi, SAE 2008
- “The Effect of Tire Characteristics on Vehicle Handling and Stability,” Allen, Meyers, Rosenthal, Klyde, SAE Paper Number 2000-01-0698
- SAE Technical Paper 1999-01-0450 – “Vehicle handling with Tire Tread Separation,” Charles P. Dickerson, Mark W. Arndt, Stephen M. Arndt, March 1999
- SAE Technical Paper 2000-01-0697 – “Properties of passenger Car Tires with Tread Detachment,” Mark W. Arndt, Michael Thorne, Charles P. Dickenson, March 2000
- EA00-023 - Firestone Report DOT Oct 2001 - Engineering Analysis Report and Initial Decision Regarding EA00-023: Firestone Wilderness AT Tires, U.S. Department of Transportation, October 2001
- SAE Technical Paper 2004-01-1075 – “Force Response during Tire Tread Detachment Event,” Mark W. Arndt, Michael J. Rosenfield, Stephen M. Arndt, Don C. Stevens, March 2004
- Arndt Tread Separation Paper – “The Influence of a Rear Tire Tread Separation on a Vehicle’s Stability and Control,” Stephen M. Arndt, Mark W. Arndt, June 2001
- Deposition of William Clay Ford, Jr., March 27-28, 2002
- Deposition excerpt from Deposition of William Clay Ford, Jr., March 27-28, 2002
- NADS Tread Report – “Investigation of Driver Reactions to Tread Separation Scenarios in the National Advanced Driving Simulator (NADS),” DOT HS 809 523, January 2003
- SAE Passenger Car Rollover PPT – “Tire Effects on Limit Performance and Rollover; SAE Passenger Car Rollover TOPTEC: Cause and Prevention,” Stephen M. Arndt, Mark W. Arndt, January 22, 1999
- SAE Paper 2006-01-1680 – “Measurement of Changes to Vehicle Handling Due to Tread-Separation-Induced Axle Tramp,” Mark W. Arndt, Michael Rosenfield, and Stephen M. Arndt, April 2006
- SAE 2007-01-0836 – “An Analysis of yaw Inducing Drag Forces Imparted During Tire Tread Belt Detachments,” Donald F. Tandy, Jr., Kenneth T. Tandy, Nicholas J. Durisek, Kevin Granat, Robert J. Pascarella, Lee Carr, and Robert Liebbe, April 2007
- “Ford warns drivers about danger of older tires,” The Detroit News Auto Insider, Friday, May 20, 2005



- "The Number of Tire Age Recommendations Grow: Bridgestone-Firestone is the Latest Entry," Safety Research and Strategies, copyright January 2006
- 09-0209 - An Analysis of the Mechanism Causing Loss of Control During a Tire Delamination," David Renfroe Alex Roberts, The Engineering Institute 2009
- Renfroe 2010 HIFI presentation - "Vehicle Stability Considerations from Rear Axle Tramp As a Result of Rear Tire Delamination," David Renfroe, Paul Simones, Hazard Information Foundation, Inc (HIFI) Tire Tech Conference, 8/10
- Renfroe - 2007 Paper – ESV 07-0142 "Effects of Process of Rear Tire Delamination on Vehicle Stability," David A. Renfroe, Ph.D., P.E., H. Alex Roberts, David Beltran, 2007
- Renfroe ASME Paper - IMECE-13600 "Designing for Vehicle Stability During Rear Tire Tread Separation Events," David A. Renfroe, Alex Roberts, 2006
- SAE 2008-01-0583 Renfroe Ipser Paper – "Solis Axle Tramp Response Near the Natural Frequency and its Effect on Vehicle Longitudinal Stability," James R. Ipser, David A. Renfroe, and Alex Roberts, 2008 World Congress, April 14-17, 2008
- Video Clip – Carr Delam Test w/Skate – produced by Ford
- Video Clips (4) – Arndt tread separation testing: end view, interior view, side view, tire view
- Video Clip – Blowout Short
- Car and Driver Magazine, July, 1995 – "Stretching the rubber envelope isn't easy." Barry Winfield
- CJ Tire Guidelines – "Selecting Replacement Tires"
- Discount Tire – Tire Mounting Information from DiscountTire.com
- DOT Release – "The Hazards of 'Mixing' Tire Types," NHTSA Fact Sheet, January, 1972
- DOT Release – "Public Advisory Warning of the Safety Hazards Involved When Motorists Mix Different Types of Passenger Car Tires," NHTSA, November 6, 1970
- Dunlop Technical Service Bulletin – "Intermixing of Radial Tires on Same Vehicle," February 22, 1974
- Goodyear Recommendation – "Find the Right Tires for Your Vehicle," Frequently Asked Questions from [www.goodyear.com](http://www.goodyear.com) – printed 12/6/2005
- Michelin – "Conditions Affecting Tire Performance – Hydroplaning"
- Michelin – "Black Taurus has new tires mounted on front wheels"
- Michelin – "Passenger & Light Truck Tire Owner's Manual"
- Rear Tire Change High – Michelin video
- New Consumer Tire Guide – "Things you need to know about auto tire care and safety – Replacement Tire Selection" Nov. 6, 1970
- Sears Employee Development Program – "Tire Basics," fax copy April 18, 1997
- Tire Industry Safety Council – "Great Debate of 1970 Revolves Around New Tires on Rear Wheels," August 2, 1970
- Aquaplaning – from [www.tribology-abc.com](http://www.tribology-abc.com), printed 12/6/2005
- Toyo Technical Bulletin – "Proper Selection of Replacement Tires," May 27, 2005
- Uniroyal.com – Mounting New Tires, printed 12/6/2005
- SAE 650145 – "Pneumatic Tire Hydroplaning and Some Effects on Vehicle Performance," Walter B. Horne and Upshur T. Joyner, Langley Research Center, NASA, Jan 1965
- SAE 680140 – "Tires and Hydroplaning," B.J. Albert, The Dunlop Co., Ltd., SAE Automotive Engineering Congress, January 8-12, 1968
- National Bureau of Standards Technical Note 528 – The Physical Condition, Use, and Performance of Passenger Car Tires in the United States of America, May 1970
- SAE 700376 – "Factors Affecting the Friction of Tires on Wet Roads," Barbara Sabey, T. Williams, and G. N. Lupton, Road Research Laboratory, Ministry of Transport, England, 5-13-1970
- Sears Tire Stores Tech-Let – Sears Tire Stores memo re: intermixing of radial tires on same vehicle, Feb 22 1974
- ASTM Frictional Interaction of Tire and Pavement – pages from "Frictional Interaction of Tire and Pavement," ASTM Special Technical Publication 793, Nov 11-13, 1981
- SAE 900105 - "The Effects of Right Side Water Drag on Vehicle Dynamics and Accident Causation," Phillip V. Hight, Jeffrey B. Wheeler, Timothy Reust, and Norman Birch - Feb 1990
- Pirelli Cinturato Guide for American and Imported Cars, 1992
- Top Ten Tire Myths - AAA World, May-June 1994
- 1993 NHTSA recommendations – from "Scientific Automobile Accident Reconstruction," Martin E. Barzelay and George W. Lacy, 1994
- SAE 950138 – "Hydroplaning and Accident Reconstruction," Francis Navin, university of British Columbia, SAE International Congress and Exposition February 27 – March 2, 1995

- 1998 Costco tire basics – Costco Wholesale Employee Development Program – Tire Basics Level I
- 99 MAST Fitment Guide - Tire Mixing pages from 1999 MAST Fitment Guide
- 1999 Goodyear new pair – tire placement information from [www.goodyear.com](http://www.goodyear.com)
- 2001 Etires - q & a – pages from [etires.com](http://etires.com) Tire Talk & FAQs
- 2001 Globe new and reviews – “Getting a Grip on Winter – How Seasonal Tires and Traction Aids Work Together to Reduce Risk,” Graeme Fletcher, from [www.globemegawheels.com](http://www.globemegawheels.com) 3/11/2001
- 2001 Michelin ad – Advertisement about Michelin’s Two Tire Mounting Policy, 2001
- 2001 Michelin letter to Car Talk – Letter to Tom and Ray at Car Talk from Nancy Banks, Director of Public Relations, Michelin N.A., June 18, 2001
- 2001 Michelin – letter to Costco – Letter to Costco Wholesale regarding mounting two new tires from Barry J. Downs, Vice President, Michelin Americas Small Tires, April 26, 2001
- 2001 Michelin press release – “How to Put Your best Foot Forward Isn’t Always Obvious,” November 7, 2001
- Making Do With Two - Auto Week, Dec 31 2001
- SAE 2002-01-0553 – “Single Vehicle Wet Road Loss of Control - Effects of Tire Tread Depth and Placement,” William Blythe and Terry Day, SAE World Congress, March 4-7 2002
- SAE 2002-01-1183 – “Estimation of Tire-Road Friction using Tire Vibration Model,” Takaji Umeno, Eichi Ono, Katsuro Asano, Shoji Ito, Akira Tanaka, Yoshiyuki Yasui, and Mamoru Sawada, SAE World Congress, March 4-7, 2002
- 2002 ID Corvette page tire myths – Tire Myths courtesy of Goodyear Tire Engineering, 2002
- Bridgestone Firestone Two Tire Application Policy – Bridgestone Firestone Technical Bulletin re: Two Tire Application Policy, April 2003
- 2003 BF Goodrich owner's manual – Passenger and Light Truck Tire owner’s Manual 2003
- 2003 Safety Tipster issue – The Monthly Safety Tip, General Services Division Safety Support, March 2003
- 2004 Costco Q&A web pages – Tire FAQs from [Costco.com](http://Costco.com) 2004
- 2004 Motor Trend testing article – “A Taste of Tire Testing,” Chris Walton, Motor Trend May 2004
- SAE 2006-01-1560 – “Realistic Rear Axle Hydroplaning during Forward Motion,” L.D. Metz, J.R. Kinney, and D. Herling, SAE World Congress, April 3-6, 2006
- 10th Worldwide Tire Survey - Replacement Tires – ExxonMobil Presentation to NHTSA, March 22, 2007
- 2007 Walmart - replacing tires – “Tires: How Many Tires Do I Need?” from [www.walmart.com](http://www.walmart.com), 7/2007
- 2008 Tire Rack – “Where to Install New Pairs of Tires?” [Tirerack.com](http://Tirerack.com), 7/2008
- 2009 Nissan 370Z warranty info – page from 2009 Nissan 370Z Warranty Information Booklet
- 4 Day Tire Stores Ad – Best Tires Go in Front? Wrong
- ETD Discount Tire Centers Vehicle Maintenance Tips – Tire Rotation Page from website
- Michelin Replacement Questions – page regarding tire placement from [www.tires.michelin-us.com](http://www.tires.michelin-us.com)
- The Investigators Guide to Tire Failures – excerpt from “The Investigators Guide to Tire Failures,” R.J. Grogan, Institute of Police Technology and Management
- CooperProdMan Search-Manual-Online – Cooper Tires 2010 Product Manual
- CooperTires-Passenger Tire Brochure – Cooper Tires Passenger Car Tire Brochure
- 2009 02 11 – “Human performance & Vehicle Group Chairmen's Report of Operational Testing,” National Transportation Safety Board Office of Highway Safety, Washington, D.C. 20594
- SAE 2010-01-0772 “Effect of Aging on Tire Force and Moment Characteristics,” D. Tandy, R. Pascarella, K. Tnady, and J. Neal, 4/12/2010
- SAE 2011-01-0973 “Steering and Handling Performance During a Full Tire Tread Belt Separation,” D. Tandy, R. Pascarella, B. Ault, C. Coleman, and K. Tandy, 4/12/2011
- SAE 2013-01-0776 “A Comparison of 25 High Speed Tire Disablements Involving Full and Partial Tread Separations,” G. Beauchamp, D. Koch, and D. Thornton – Kineticorp LLC, 4/8/2013
- Cooper – “Replacing Less Than Four Tires”
- Tandy - Step Steer 'Modified' 2003 Ford E-350 and other vehicles
- Tandy – Handling and Stability During and After a Right-Front Tire Blowout (report, video and data)
- Tam Heavy Truck Accident Video and Virginia Police Report
- Pipes F350 Left-Front Tread Separation/Blowout and Impact Accident Materials

## IV. Background Information

**Vehicle:** 2003 Chevrolet Silverado C1500

**When:** 5/1/15 Friday at 06:57

**Where:** Hall County, NE – Interstate 80 eastbound

**How:** Right-rear tire failure, pull to right, countersteer to left, CCW yaw into median, rollover to P-side, landed on wheels

<b>Occupants:</b>	<b>Driver</b>	<b>Larry Blair</b>	<b>(5/23/73)</b>	<b>Injured</b>	<b>235 lbs</b>
	<b>MF</b>	<b>Shane Loveland</b>	<b>(4/1/82)</b>	<b>Injured</b>	<b>244 lbs</b>
	<b>RF</b>	<b>Jacob Summers</b>	<b>(12/3/91)</b>	<b>Injured</b>	<b>158 lbs</b>

<b>Total Occupant Weight:</b>	<b>637 lbs</b>
<b>Cargo Weight:</b>	<b>+Tools/Gear</b>
<b>Silverado Curb Weight:</b>	<b>4227 lbs</b>
<b>Silverado GVWR:</b>	<b>6400 lbs</b>

215017377 44445		State of Nebraska Investigator's Motor Vehicle Accident Report		Sheet 1 of 2	
1 Total Number of Vehicles 01		2 Date of Accident 05/01/2015		3 Time of Accident 0657	
4 Place of Accident COUNTY: Hall CITY: _____		5 Police Agency 0700		6 Investigation Made at Scene X YES <input type="checkbox"/> NO	
7 Road on Which Accident Occurred DISTANCE FROM MILEPOST: 2440		8 Street or Highway INTERSTATE 80		9 State of Occurrence American	
10 If at Intersection NAME OF INTERSECTING ROADWAY: _____		11 If Not at Intersection DISTANCE FROM NEAREST TOWN: 3.00		12 Latitude 40.724380	
13 If Accident Was Outside City Limits, Indicate Distance From Nearest Town DISTANCE FROM TOWN: 4.00		14 Name of Nearest Town SHELTON		15 Longitude -90.001920	
16 R. Horn Code 1		17 S. Police Station Code 1		18 Does Accident Involve Damage to State Property? X YES <input type="checkbox"/> NO	
19 DRIVER LICENSE NO. H13702183		20 DRIVER NAME LARRY R. BLAIR		21 DATE OF BIRTH 05/23/1973	
22 DRIVER ADDRESS 224 E 4TH ST, AXTELL, NE 68924		23 CITY, STATE, ZIP AXTELL, NE 68924		24 PHONE 308-637-6660	
25 DRIVER ADDRESS DANDEE CONSTRUCTION / DAN BUSER		26 CITY, STATE, ZIP DANDEE, NE 68640		27 PHONE 308-637-6660	
28 LICENSE PLATE NO. 092396		29 VEHICLE NO. 1 2003 Chevrolet SC1 Pickup truck		30 COLOR blue	
31 VEHICLE NO. 2 10CEC14X33Z115363		32 VEHICLE NO. 3 KRAMER'S		33 VEHICLE NO. 4 0005CPP000197109	
34 DRIVER LICENSE NO. _____		35 DRIVER NAME _____		36 DATE OF BIRTH ____/____/____	
37 DRIVER ADDRESS _____		38 CITY, STATE, ZIP _____, _____, _____		39 PHONE _____-_____-____	
40 DRIVER ADDRESS _____		41 CITY, STATE, ZIP _____, _____, _____		42 PHONE _____-_____-____	
43 LICENSE PLATE NO. _____		44 VEHICLE NO. 1 YEAR: 2015, MAKE: Chevrolet, MODEL: SC1, BODY STYLE: Pickup truck, COLOR: blue, VIN: 10CEC14X33Z115363		45 VEHICLE NO. 2 YEAR: _____, MAKE: _____, MODEL: _____, BODY STYLE: _____, COLOR: _____, VIN: _____	
46 VEHICLE NO. 3 YEAR: _____, MAKE: _____, MODEL: _____, BODY STYLE: _____, COLOR: _____, VIN: _____		47 VEHICLE NO. 4 YEAR: _____, MAKE: _____, MODEL: _____, BODY STYLE: _____, COLOR: _____, VIN: _____		48 VEHICLE NO. 5 YEAR: _____, MAKE: _____, MODEL: _____, BODY STYLE: _____, COLOR: _____, VIN: _____	
Complete this section for all injured persons (Complete a continuation report, if more than three were injured)					
49 INJURED PERSON 1 LARRY R BLAIR 224 E 4TH ST, AXTELL, NE 68924		50 DATE OF BIRTH 05/23/1973		51 SEX M	
52 TREATMENT Good Samaritan Hospital		53 TREATMENT Wood River Rescue Unit		54 TREATMENT Good Samaritan Hospital	
55 INJURED PERSON 1 SHANE A LOVELAND 304 SHEPPARD AVE, HILDRETH, NE 68947		56 DATE OF BIRTH 04/01/1982		57 SEX M	
58 TREATMENT Good Samaritan Hospital		59 TREATMENT Good Samaritan EMS		60 TREATMENT Good Samaritan Hospital	
61 INJURED PERSON 1 JACOB S SUMMERS 823 S. MAIN, WILBER, NE 68485		62 DATE OF BIRTH 12/03/1991		63 SEX M	
64 TREATMENT Good Samaritan Hospital		65 TREATMENT Shelton Volunteer Fire & Rescue		66 TREATMENT Shelton Volunteer Fire & Rescue	

## Police Accident Report

## V. Accident Reconstruction

Gilbert Engineering LLC inspected the subject accident scene and vehicle. Through physical evidence left at the scene and on the vehicle, the Police materials and the available photographs, the vehicle's motion during this accident was reconstructed. My reconstruction opinions are based upon recognized and accepted engineering principles as well as over twenty years of experience in evaluating hundreds of tread separation and rollover accidents.

### Subject Vehicle

The subject Silverado was inspected on 1/17/17 in Omaha, NE. Specifications, damage, and suspension characteristics were documented. There were no signs of prior accidents. The tires were a slightly larger size than listed on the door placard, but were a much high load carrying capacity than stock.

**2003 Chevrolet Silverado C1500 4x2  
VIN: 1GCEC14X33Z115363**



**Accident Silverado**

**Odometer:** NA - Elec  
**Engine:** 4.3L V6  
**Trans/Drive:** Automatic/4x2 rear  
**OE Tire Size:** P255/70R16 S  
**GVWR:** 6400 lbs  
**Wheelbase:** 133 inches

Tire:	Manuf :	DOT:	Size :
LF	Goodyear	MDOR NJHV 234	LT235/85R16 LR E
LR	Goodyear	MDOR NJHV 234	LT235/85R16 LR E
RR	Goodyear	MDOR NJHV 244	LT235/85R16 LR E
LF	Goodyear	MDOR NJHV 194	LT235/85R16 LR E
Spare			



**Door Placard**



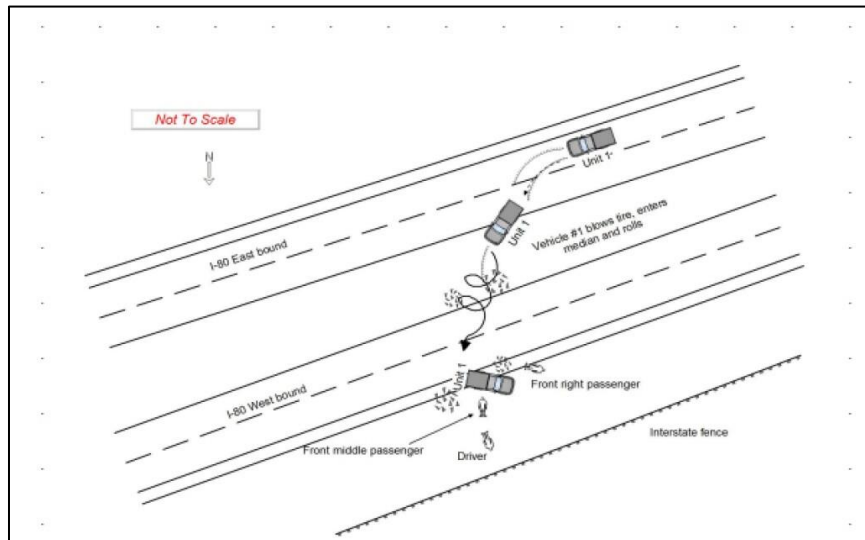
### Scene Inspection

Gilbert Engineering LLC also inspected the Loveland accident scene on 1/17/17. The pavement surface at the time of the inspection was asphalt lanes and shoulders and was free of any unusual undulations or slopes. Critical points in the vehicle path were located using the police photographs and physical evidence at the scene. In the photograph below, the camera is pointing in the direction that the Silverado was traveling.



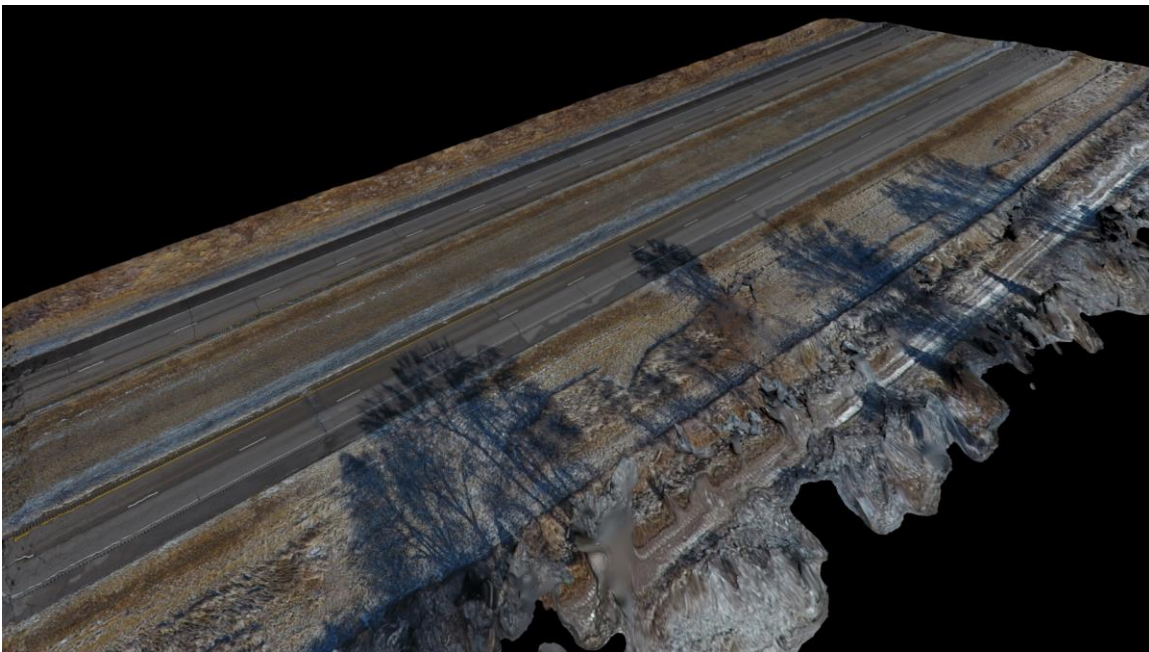
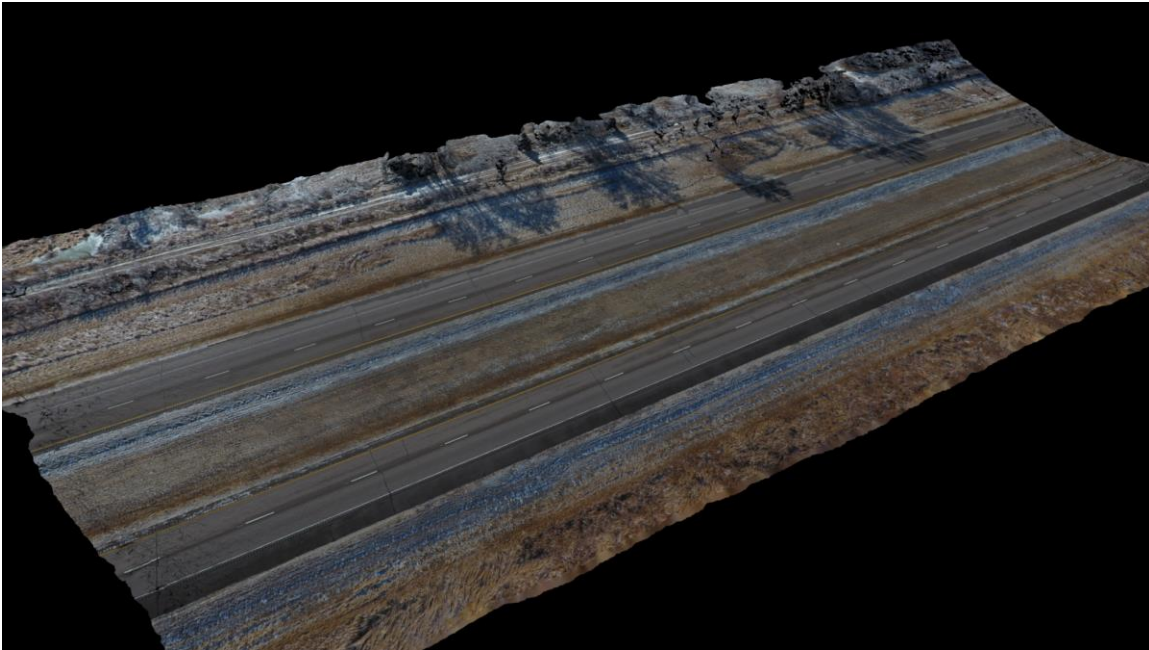
**GE Scene Photo**

Using the available information, including the police report and available photographs, vehicle positions in the accident sequence were reconstructed. The officers did not take any measurements of the accident scene but their drawing is shown below, showing general vehicle motion.



**Police Drawing**

An accident scene 3D model was created using drone technology and is shown below.



**GE Scene Drone Model**

### Accident Sequence and Calculations

The Silverado was traveling eastbound on I-80 at or below the posted 75 mph speed limit at the time of the accident. The right-rear tire tread partially separated, causing the vehicle to pull to the right. The driver steered to the left to counter the pull, causing the vehicle to rotate counterclockwise (as seen from overhead). The police photo below shows the yaw marks leading into the median.



**Yaw Marks – Police Photo**



The Silverado continued rotating/yawing into the dirt/grass median despite the driver's effort to countersteer back to the right. The vehicle rolled over to the passenger's side at between 35-38 mph. The police photo below shows the yaw marks leading to the trip point in the median and includes a "ghost" image of the vehicle to illustrate its orientation at the roll point.



**Rollover to Passenger's Side with "Ghost"– Police Photo**

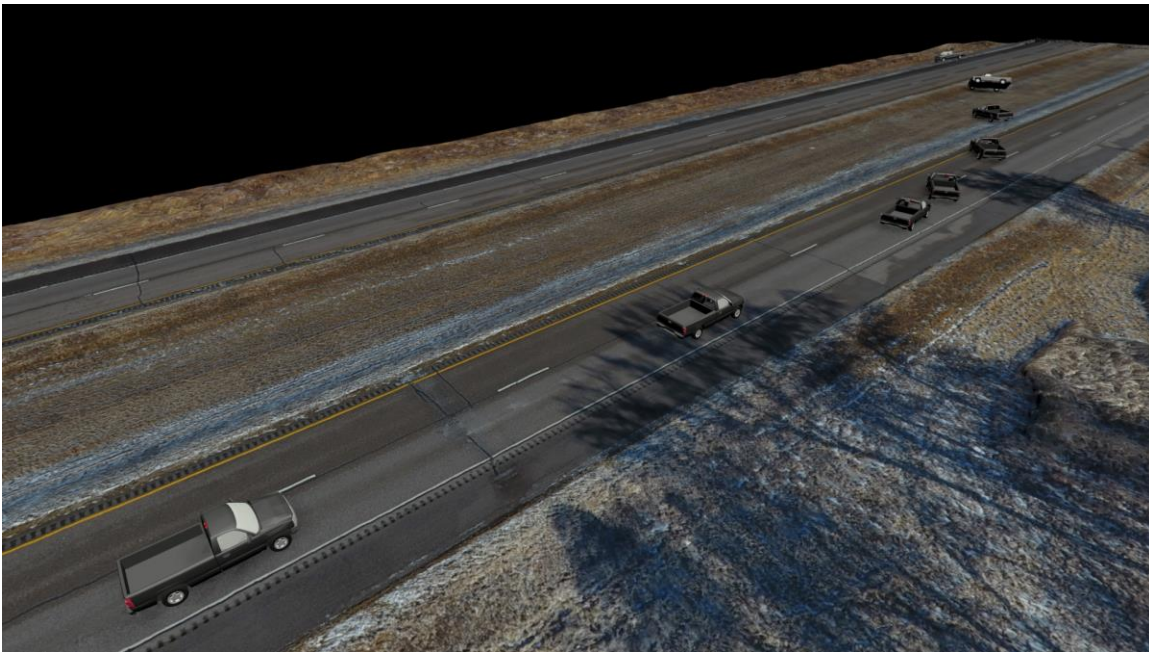
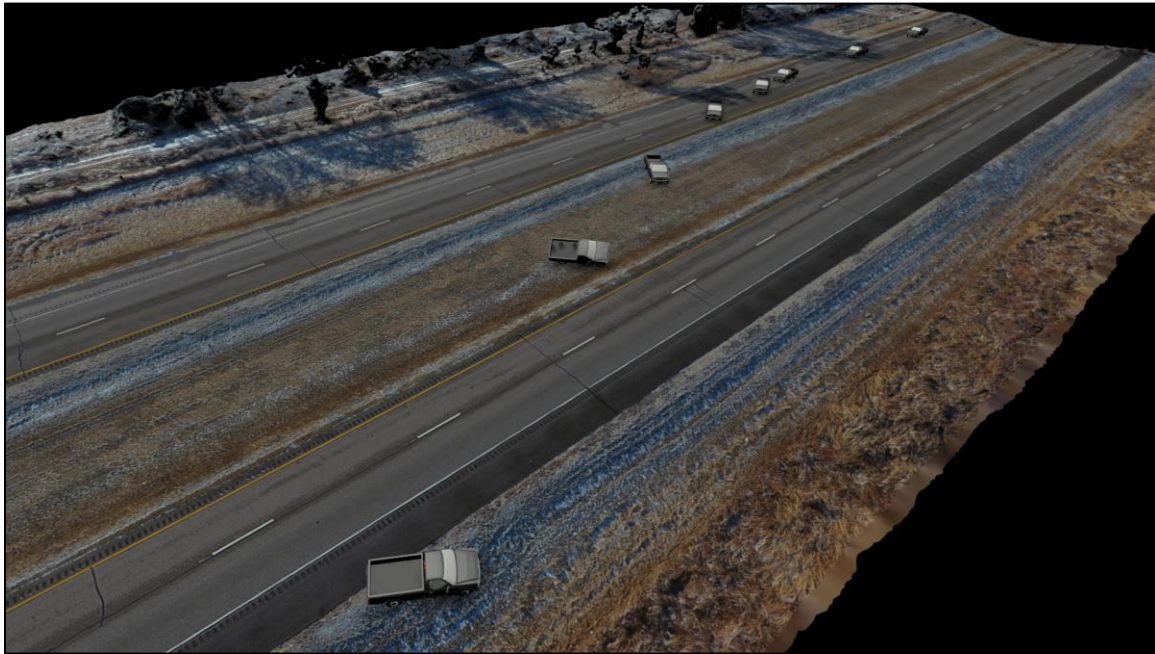


The Silverado rolled over 2.0-3.0 rolls over 104.5 feet and landed on its wheels.



**Final Rest on Wheels – Police Photo**

The following images are of the scene model with vehicle positions included.



**GE Scene Model with Vehicle Positions**

A separated tread causes the vehicle to pull in the direction of the separation. Drivers attempt to correct this condition by steering the vehicle in the opposite direction, often causing the vehicle to yaw because the failed tire has severely diminished cornering capacity. The result can be an uncontrollable spin, vehicle rollover, multiple fishtails and steering reversals (in the case of a relatively sharp driver), or a perfect steering correction with no fishtail (in the case of a professional or trained driver). Published literature,



including a Federal Government study, illustrates the potential dangers of these events (NHTSA DOT HS 809 523, January 2003).

A vehicle with a separated front tire tends to understeer, while a vehicle with a separated rear tire tends to oversteer (see Mountaineer testing below). In the absence of contributing environmental characteristics such as a curve, a barrier, or some other obstacle, a front tire disablement is generally a more controllable event for an average driver.

Testing of a 2001 Mercury Mountaineer with a tread separation by Gilbert Engineering LLC illustrates that even relatively small driver inputs can cause loss-of-control for an average driver. A J-turn test run (JTR12) with only 65 degrees of steering input at a speed of 39 mph resulted in an uncontrollable spin due to the diminished cornering capacity of the separated tire. Our results were presented at a Canadian Road Safety conference in June 2009.



**Yaw and Rollover Sequence from Iowa Test**

## VI. Driver Response Studies

More than twenty-five years-worth of studies have reported a broad range of driver responses to pseudo-emergency situations. In some studies, objects were thrown in front of drivers. In others drivers were asked to partake in situations where they were required to drive quickly along a determined path. Data from these studies showed that some drivers respond by braking, some by steering, and some by a combination of both. Additionally, those who steer, with and without braking, generated lateral accelerations ranging from moderate to severe. The studies also reported a wide spectrum of steering inputs (both steer angle and rate). At least one Toyota representative explained these varying driver responses by pointing out that drivers in emergencies are not interested in following a path, but rather avoiding an obstacle.

During controlled testing with an intentional partial rear-tire tread separation, a trained driver was unable to control a Ford Explorer. The driver made no steering input, but the vehicle pulled uncontrollably to the side with the failed tire. The vehicle's safety outriggers failed, and the Explorer rolled over.

A governmental study (see materials reviewed) analyzes driver reactions to rear tread separations and also shows how dangerous a tread separation event can be. The researchers concluded:

- During trials in the study where drivers were not expecting the rear tread separation, of the drivers that responded to the tread separation by steering or braking, 100% had steering as their initial response. It should be noted that the signal to the driver that a tread separation was occurring was only vibration, and no vehicle pull to either side.
- Speed-steer stability boundaries to initiate a spinout for vehicles with a separated rear tire were determined to range from 15 to 26 degrees of steering input at 60 mph for the vehicles modeled in the study.
- Knowledge of an imminent rear tread separation reduced the overall probability of loss of control for drivers in the study. Findings from test track studies in which test drivers were aware of an imminent tread separation may underestimate the extent to which tread separation occurring in the real world leads to instability and loss of vehicle control.

The subject accident involved driver inputs that were foreseeable and known to the entire automotive industry.

## VII. Opinions/Conclusions

1. The Loveland accident, involving a 2003 Chevrolet Silverado, was caused by a right-rear tire failure. The vehicle was traveling eastbound on I-80 at or below the posted 75 mph speed limit at the time of the accident. The right-rear tire tread partially separated, causing the vehicle to pull to the right.
2. The driver steered to the left to counter the pull, causing the vehicle to rotate counterclockwise (as seen from overhead).
3. The Silverado continued rotating/yawing into the dirt/grass median despite the driver's effort to countersteer back to the right. The vehicle rolled over to the passenger's side at between 35-38 mph. The Silverado rolled over 2.0-3.0 rolls over 104.5 feet and landed on its wheels.
4. A vehicle with a separated rear tire is difficult to control. A cornering vehicle with no tread on a rear tire tends to oversteer. Even trained drivers may have difficulty controlling a tread separation event. Published studies illustrate that tread separation events can be extremely dangerous. Testing by Gilbert Engineering LLC illustrates that even relatively small driver inputs can cause loss-of-control for an average driver.
5. Driver response studies show that there is a wide range of inputs when drivers are faced with emergency situations. It is foreseeable that some will bring a vehicle to its limits especially in the event of a catastrophic tire failure. The subject accident involved driver inputs that were foreseeable and known to the entire automotive industry.
6. There were no pre-existing vehicle conditions that caused or contributed to this accident with the exception of the failed tire on the Silverado.

These opinions are to a reasonable degree of engineering certainty. They are subject to modification if additional information becomes available.

Yours very truly,

Micky Gilbert, P.E.



**Micky Gilbert, P.E.**  
***Gilbert Engineering LLC***  
16254 W 77<sup>th</sup> Lane  
Arvada CO 80007

**Education**

Bachelor of Science degree in Mechanical Engineering, Colorado State University, 1993  
Worked with Professional Engineers and Accident Reconstructionists since 1993, studying vehicle and accident dynamics

**Employment**

Race Car Mechanic at Skip Barber Racing, 1991-1994  
Mechanical Engineer, James L. Gilbert and Associates, 1993–1997  
Mechanical Engineer, Gilbert Engineering LLC, 1998-present  
Associate Engineering Consultant, Professional Investigative Engineers, 2001~2012

**Professional Experience**

- **Reconstruction/Analysis of Accidents**
- **Vehicle Dynamics Testing of Race Cars and Passenger Cars**
- **Automotive Computer Analysis and Simulation**
- **Analysis of Auto Manufacturer Documents and Tests**
- **Design Analysis of Vehicle Structures and Systems**
- **Patent Design Work of Anti-Rollover Device and Rollover Steering System**
- **Car-to-Car Crash Testing**
- **Testing and Design of Modified Passenger Vehicles**
- **Teaching courses on accident reconstruction and vehicle dynamics to Police Officers, Engineers, Insurance Adjusters and Attorneys**
- **Design and rollover crash testing of automated SUV systems (with and without tread separation)**

**Related Vehicle Dynamics/Auto Racing Experience**

1991-1996	Skip Barber Formula 2000 and Race Karts
1996	National Champion, Skip Barber Formula 2000 Midwest series
1997	2 <sup>nd</sup> place, Superkarts 250cc National Championship
1997-present	BMW School Instructor, Teen Survival Instructor
1999-2000	Test Driver for Hoosier Racing Tires
1999-2000	Chief driving instructor of Pro-One Motorsports academy
1999	SCCA National Champion – Formula Mazda, Central Division
2000	Third consecutive podium – SCCA Valvoline Runoffs – Formula Mazda
2005	Star Mazda Pro Series – Expert Champion
2006	Obtained Indy Racing League license and drove in first Indy Pro race
2007-2008	Firestone Indy Lights Series driver

**Professional Affiliations**

Colorado Professional Engineer, Registration No. 35682  
Accreditation Commission for Traffic Accident Recon. (ACTAR), Reg. No. 1240 (2001-2006)  
Society of Automotive Engineers (SAE)  
Society of Accident Reconstructionists (SOAR)  
American Society for Testing and Materials (ASTM)  
American Society of Mechanical Engineers (ASME)  
Accident Reconstruction Communications Network (ARC Network) – No. ARC0827  
National Association of Professional Accident Reconstruction Specialists (NAPARS) – No. 26114  
Canadian Association of Road Safety Professionals (CARSP)

## **Publications/Patents**

- Micky Gilbert, Jim Gilbert, "Engineering Principles in Vehicle Rollover Litigation" in Crashworthiness Litigation, published by West Group, 1998
- Micky Gilbert, "Analysis of Toyota LAR Testing", NHTSA Docket 2000-8298, No. 4
- "Method and Apparatus for Reducing Vehicle Rollover", Micky Gilbert, United States Patent Number 6,170,594, January 9, 2001
- Micky Gilbert, "Prevention of On-Road, Untripped Rollover by use of an Anti-Rollover Device", 2000-01-2666, presented to Society of Automotive Engineers, IBEC Conference, 10/00
- Micky Gilbert, "Reconstruction of SUV Untripped Rollovers", The Investigative Engineer, 7/02
- Micky Gilbert, Michael Kaplan, David Bilek, Steve Kaplan, David Vellos, "An Examination of Rim Gouging and Its Relation to On-Road Vehicle Rollover", The SOARce, Spring 2004
- Micky Gilbert, "Effects of Tire Shoulder Wear on Vehicle Rollover Limit Testing", SAE #2003-01-2865, JSAE #20037145, presented in Tokyo, Japan on 10/28/03
- Gilbert Engineering, LLC comments to Rollover Docket NHTSA-2001-9663-79
- "Rotation Limiter", Micky Gilbert, John Olmstead, United States Patent Number 7,134,357, November 14, 2006
- Micky G. Gilbert, John Olmstead, Erich Woessner, Tom Mueller, "Effect of Yaw Control on SUV Rollover", The SOARce, Autumn 2004
- Renfro, D., Roberts, A., Gilbert, M., "Vehicle Rollover Maximum Limits", International Journal of Vehicle Design, 2004
- Micky G. Gilbert, John Olmstead, Erich Woessner, Tom Mueller, "Wet Pavement Handling Tests", The SOARce, Autumn 2005
- Micky G. Gilbert, John Olmstead, Erich Woessner, Tom Mueller, "Rollover Testing: Analysis of Steer Input Timing", SAE Paper Number 2006-01-0801 – presented at 2006 SAE World Congress (4/6/06)
- Gilbert Engineering LLC, "1991 Ford Explorer XLT 4x2: Automated Untripped Rollover Test", ARC-CSI Crash Conference 2006 also Published in Summer 2006 SOARce, also Presented at International Traffic Medicine Association conference Melbourne, Australia 10/17/06
- Gilbert Engineering LLC, Rollover Crash Test of 1997 Toyota 4Runner SR5 4x2, ARC-CSI Crash Conference 2006
- Micky Gilbert, Tom Mueller, "2001 Ford E-350 XLT Super Duty Vehicle Dynamic Performance Testing" The SOARce, Winter 2007
- Wilson, L.A., Gilbert, M., Godrick, D., "Reconstruction and Analysis of Steering-induced, On-road, Untripped SUV Rollover Tests" Collision, Spring 2007
- Wilson, L.A., Gilbert, M., Godrick, D., "Reconstruction and Analysis of Steering-induced, On-road, Untripped SUV Rollover Tests (Part 2)" Collision, Winter 2007
- Micky Gilbert, P.E. and Daniel A. Godrick, "Vehicle Dynamic Performance Testing 2002 Volvo S80 T6," The SOARce, Winter 2008
- Michael Gilbert, Daniel Godrick, Richard Klein, "The Effect of Longitudinal Center of Gravity Position On the Sway Stability of a Small Cargo Trailer", IMECE2008-66022 – presented at 2008 ASME International Mechanical Engineering Congress and Exposition
- M. Gilbert, D. Yanda, T. Mueller, "Dynamic testing of an SUV with Tire Tread Separation", Canadian Multidisciplinary Road Safety Conference XIX – presented in Saskatoon, Saskatchewan at CMRSC, CCMSR Conference 6/8/09
- S. Andrews, M. Partain, D. Renfro, M. Gilbert, "A Comparison of Computer Modeling to Actual Data and Video of a Staged Rollover Collision", 21<sup>st</sup> International Technical Conference on the Enhanced Safety of Vehicles 6/09
- M. Gilbert, B. Stolz, "Pre-Rollover Vehicle Dynamics of SUVs in Untripped Rollover Tests", 20<sup>th</sup> Canadian Multidisciplinary Road Safety Conference, June 2010
- M. Gilbert, T. Mueller, J. Nirvelli, "The Effect of Tread-Separation on Vehicle Controllability", Hazard Information Foundation, Inc (HIFI) Tire Tech Conference, 8/10
- M. Gilbert, T. Mueller, J. Nirvelli, "Forensic Interpretation of Driver Countersteer", 22nd Canadian Multidisciplinary Road Safety Conference, Banff, Alberta, June 10-13, 2012
- Desmoulin GT, Rabinoff, Stolz B and Gilbert M, "A Biomechanical Method for Reconstruction of Tumbling Trampoline-Associated Cervical Spine Injuries Using Human and Anthropometric Test Dummy Data, Journal of Forensic Biomechanic, Volume 5 • Issue 1 • 101, April 2014
- M. Gilbert, B. Stolz "Effect of Oversized Wheels and Tires on SUV Roll Stability", 24th Canadian Multidisciplinary Road Safety Conference, Vancouver, Canada June 2-4, 2014
- M. Gilbert, G. Hoffman "Tow Dolly Handling & Stability", The SOARce, Winter 2018

# Micky Gilbert, P.E.

## Gilbert Engineering LLC

### Depositions

1/7/14	Johnson vs Cooper Los Angeles	Case No 34-2010-00093643	3/27/18	Florence Div, SC	Case No. 2015-CP-27-0211 & 0212
1/15/14	Canaday vs Trade Union County of Orangeburg, SC	Case No. 2012-CP-38-1476	5/15/18	Jasper County, SC	Count No 9-CV-17-233
2/4/14	Andey vs Ford Richland County, SC	Case No 2012-CP-40-3501	6/19/18	Tackett vs Bridgestone Carlton County, MN	2017-CP-21-1644
2/11/14	Sanson vs Ford Collier County, FL	Case No. 2012-CA-2776	7/19/18	Senseney vs Cooper Florence County, SC	Civil Action No 1:16-DV-3-DMB-DAS
3/11/14	Sanches vs Cooper Nashville Div, TN	Case No 3:12-cv-00761	7/24/18	Ware vs Sailun Aberdeen, MS	Civil Action No. 17-40059-TSH
4/1/14	Sandoval vs Nexen Orange County, CA	CASE NO. 30-2010-00408212	7/31/18	Murphy vs Walmart Massachusetts	CV-2016-900273
4/15/14	Heger vs GM Franklin County, OH	Case No 11 CV 013465	9/19/18	Smith vs Ford Dallas County, AL	Civil Action No 2016-CP-15-1365
5/6/14	Perry vs GM Palm Beach Co, FL	Case No 50 2012 CA 013039	10/2/17	Kristensen vs Goodyear Colleton County, SC	Case No. 15000658 CA
5/13/14	Glover vs Ford Bunberg Co, SC	Case No. 2013-CP-05-29	10/16/18	Clark vs WalMart Bay County, FL	Case No. 17AB-CC00422
5/28/14	Perez vs Cooper Western Dist. Of OK	Case No CIV-13-32-D	10/24/18	Huin vs Ford Platte County, MO	Civil Action No 1:17-CV-00788
6/24/14	Patel vs Goodyear Tire Co	Case No. 12-0336-NP	11/28/18	Gray vs Nissan Middle District of AL, Northern Div	Civil Action No 2016-0044 CI
7/2/14	Berrien Co., MI	Case No 13-cv-00255-JNE-AJB	12/12/18	Wilson vs Hankook Washington County, MS	Civil Action No 2017CP-28-308
7/8/14	Hoffman vs Enterprise Minnesota District	CASE NO. 2013-CP-23-00384	1/15/19	Kershaw County, SC	No. CV2016-008280
7/15/14	Rish vs Boy Scouts Am. Hampton County, SC	Civil Action No. 5:13-cv-2291-IPJ	2/27/19	Nance vs County of Pinal, et al	Case No 2016-CP-08-03046
7/22/14	Clark vs Michelin Huntsville, AL	CV-12-900116.80	2/28/19	LaSalle vs Monro Muffler Berkeley County, SC	Case No 2018-CP-15-00104
8/20/14	Smith vs Ford Chambers County, AL	67-CV-2012-900047.00	3/5/19	Clack vs Atlas Van Lines Colleton County, SC	Case No 05-2013-CA-25726
8/26/14	Zimmerman vs Michelin Winston County, AL	Civil Action No. CV-2013-900001		Cushing vs AAU Brevard County, FL	
9/3/14	Hughes vs Cooper Talladega County, AL	Case No. 110905721			
9/9/14	Sleight vs Ford Weber County, Utah	Case No CV-2013-474-6			
10/7/14	Torres vs Everett Maxey GMC Benton County, AR	CV-2012-901515			
10/14/14	Sallee vs Ford Montgomery County, AL	Case No.: C20127091			
12/16/14	Martin vs Heaven Sent Pima County, AZ	Case No INC 1206734			
1/13/15	Hrycyk vs Sumi Rubber Riverside, CA	CV-2013-900066.00			
1/22/15	Carlisle vs Kenny Knox Tire Chambers County, AL	JCCP 4621			
2/10/15	Saylor vs Bob Baker Lexus Los Angeles, CA	NO. 11-8-1416			
2/17/15	Smith vs Goodyear Calhoun County, TX	Case NO. 09 L 013814			
3/10/15	Demas vs Nissan Cook County, IL	Case No. 1316CV-30546			
3/24/15	Young vs Toyota Jackson County, MO	Case No. 13-cv-2393 JTM/DJW			
4/28/15	McKellips vs Kumho Kansas City, KS	Civil Action No: 20 14-CP-02-00569			
5/7/15	Davenport vs Goodyear South Carolina Common Pleas	No. 13-2-07728-9			
5/12/15	Huhner vs Les Schwab Snohomish County, WA	Cause No. D-1-GN-10-001511			
5/27/15	Theis vs Goodyear Austin, TX	No. A-14055-C			
7/8/15	Rios vs Walmart Orange County, TX	CASE NO.: 01-2013 CA 001798			
8/13/15	Morgan vs Goodyear Alachua County, FL	No 16797			
9/22/15	Hill vs Plains Tire Converse County, WY	Case No.: CV-2014-902220			
11/12/15	Curtis vs Delta Tire Mobile County, AL	Case No 1:14-cv-01122			
2/23/16	Frazier vs Hankook West Dist of TN	09-CV-2014-900066.00			
3/8/16	Austin vs Ford Bullock County, AL	Civil Action No. 15-C-78			
4/7/16	Maitis vs Summit Point Jefferson County, WV	CAUSE NO. 2014-23177			
3/15/16	Trichel vs Maitis Harris County, TX	Case No. 2013CVT001200 D1			
3/22/16	Hernandez vs Ford Webb County, TX	Civil Action No. 2014-CP-36-00363			
3/29/16	Villalobos vs Goodyear Newberry County, SC	57-CV-2014-900080.00			
4/5/16	Cail vs Bridgestone Russell County, AL	Case No: CIVDS1406296			
4/13/16	Sansers vs Sunrise Ford San Bernardino County, CA	Civil No: 6:13-CV-02153-TMC			
4/19/16	Donze vs GM Greenville, SC	Case No: 81649			
5/24/16	Kitchens vs Raffield Tire Bibb County, GA	Case No BC509249			
5/26/16	Weaver vs Cerritos Ford Los Angeles County, CA	Case No D-101-CV-2014-02574			
7/19/16	DeLaRosa vs Cooper/Ford Santa Fe County, NM	Case No 2:14-cv-00295-CG-M			
8/2/16	Thompson vs Hankook/BS Southern District of AL	Case No 2015-CP-15-435			
8/30/16	Morro vs Colony Tire Colleton County, SC	Case No 42-2014-0151-CA-B			
9/7/16	Mahabirsingh vs Kumho Marion County, FL	CASE NO. 16-2015-CA-003025-XXXX-MA			
11/16/16	Riley vs Toyota Duval County, FL	Civil Action No 2015-CP-40-03309			
11/29/16	Harper vs Bridgestone Richland County, SC	No C20150922			
3/21/17	Anderson vs Ford Pima County, AZ	Cause No. 14-02-23253-CVW			
4/11/17	Martinez vs Cooper Ward County, TX	Civil Action 2015-CP-42-02226			
5/2/17	Anderson vs Cooper Spartanburg Co., SC	CAUSE NO. C-3505-14-F			
6/13/17	Villarreal vs Ford Hidalgo County, TX	Case No: CA13-1449 Div 55			
6/29/17	Grace vs Bunnell Tire Sales, Inc. ST. Johns County, FL	CASE NO.: 16-2015-CA-001475-XXXX-MA			
7/11/17	New vs GM Duval County, FL	Case No CV2016-050917			
8/1/17	Wing vs U-Haul Maricopa County, AZ	CA Number 2015-CP-32-3340			
8/29/17	Ocampo vs Tire Country Inc Chesterfield County, SC	Civil Action No 3:17CV109			
9/26/17	Benedict vs Hankook Richmond Div, VA	Case No 49-2016-CA 00294PL			
9/29/17	Persaud vs FCA Osceola County, FL	Case No A 142 173			
11/8/17	Mercado vs Caltrans Alameda County, CA	Case No. 2016-CA-000652			
11/28/17	Stewart vs Uber Flagler County, FL	No. P014-1385			
12/19/17	Aguirre vs Nissan Yolo County, CA	No. CV14-1833			
12/28/17	Witt vs Michelin Parker County, TX	Case No. 2014-CA-001436			
1/3/18	Novak s Ford Pasco County, FL	Case No. 4:16-cv-04032-RBH			
1/9/18	Herring vs Sutong China Tire				

### Trial Testimony

2/24/10	Parker vs Ford Montgomery, AL	CASE NO: CV-08-0900641
2/25/10	Toe vs Cooper Tire Des Moines, IA	Case No CL 106914
4/27-29/10	Holt vs Yamaha Orange County, CA	CASE NO. 60CC11291
10/7-8/10	McMahon vs. Yamaha Montgomery, AL	Case No 03-CV-2008-00030.00
1/28/11	Irwins vs Cooper Tucson, AZ	NO. C-20088135
4/6/11	Courey vs Jim Russell Racing Sonoma County, CA	Case No SCV 243900
6/2/11	Vincent vs Honda Fed Ct Augusta, GA	No. 08-CV-067
9/27-28/11	Brownell vs Ford Sacramento, CA	Case No 06AS01246
10/19/11	Hall-Edwards vs. Ford Miami, FL	CASE NO. 99-9450 CA (22)
2/7-8/12	Graves vs Toyota Hattiesburg, MS - Fed	CASE NO. 2-09CV169-KS-MTP
7/11-12/12	Delgado vs Discount Tire San Antonio, TX	NO. 2011-CI-06059
10/3-4/12	Yang vs Cooper Hennepin County, MN	No 27-CV-10-13554
11/16/12	Kim vs Toyota Los Angeles, CA	Case No. MC022470
3/7/13	Zeolla vs Ford US District Ct Mass	C.A. 4:09-cv-40106-FDS
9/10-11/13	Poty vs Ford Fl. Lauderdale, FL	Case No 07-22392-13
11/18/13	Bruner vs Key Safety Gwinnett County, GA	09C-16647-5
3/19/14	Horn vs Sears Fresno, CA	No. 11CECG00212 AMS
6/16/14	Martinez vs Honda Philadelphia, PA	Control Number 14060115
9/17/14	Applewhite vs Hyundai Clarksdale, MS	No. 14-CI-98-0086
9/30/14	Patel vs Goodyear Tire Co Berrien Co., MI	Case No. 12-0336-NP
9/24-25/15	Theis vs Goodyear Austin, TX	Cause No. D-1-GN-10-001511
2/10-11/16	Weaver vs Cerritos Ford Los Angeles County, CA	Case No BC509249
6/20/16	Hurtado vs Ford Philadelphia, PA	No 3592
2/21-22/17	Parker vs Ford Seminole County, FL	Case No 11-CA-2755-10-K
6/20/17	Frazier vs Hankook Western District of TN	Case No 1:14-cv-01122
9/11/17	Holko vs Toyota Allegheny County, PA	No. GD-15-013528
11/14-15/17	Villarreal vs Ford Hidalgo County, TX	CAUSE NO. C-3505-14-F
12/12/17	Mercado vs Caltrans Alameda County, CA	Case No A 142 173
1/23-24/18	Witt vs Michelin Parker County, TX	No. CV14-1833
3/2/5/18	Salliotte vs Ford Pasco County, FL	Case No. 2014-CA-001436
5/9/18	Aguirre vs Nissan Yolo County, CA	No. P014-1385
8/22,28/18	Wing vs U-Haul Maricopa County, AZ	Case No CV2016-050917
9/7,10/18	Brown vs Sili Philadelphia, PA	No. 00925
2/5-7/19	Smith vs Ford Dallas County, AL	CV-2016-900273





**Hourly Rate – Engineer**

\$200 per hour

\$400 per hour testimony

***Tax ID: 46-0484891***

**Technical Assistant Rate**

\$100 per hour

**Expenses**

All expenses will be reimbursed, including, but not limited to travel costs, mileage, meals, material costs, storage fees, necessary contract labor.

**Flat Rate Retainer:**

\$20,000 is our initial rate that includes all consulting, document review, reconstruction and inspection work up to the time of deposition preparation (including the authoring of an expert report, if necessary). This fee does not include expenses (which typically range between \$2,000 and \$4,000 for each vehicle and site inspection) and is non-refundable. This fee is to be paid up-front.

**Processing of Invoices:**

All invoices are to be paid within thirty (30) days.

**Deposition and Trial Testimony:**

No less than twenty-one (21) days prior to any deposition or trial testimony, all outstanding invoices must be paid current, as must the deposition preparation retainer (which typically ranges between \$8,000 and \$12,000) or, alternatively, the trial preparation retainer (which typically ranges between \$10,000 and \$15,000, not including any demonstrative exhibits for trial testimony including but not limited to the graphical rendering of the crash scene).

**Duty of the Client to Timely Notify of Challenges to Qualifications, Methodology, and Conclusions:**

Due to the significant reputational repercussions associated with an adverse or negative court ruling, we must be timely informed of any challenge, including Daubert and Frye challenges, and any motion in limine, applicable to us, and receive a copy both of the challenge(s) as well as the proposed response(s) no less than five (5) days prior to the response date.

I agree to these terms:

\_\_\_\_\_

16254 W 77<sup>th</sup> Lane  
Arvada CO 80007

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